

REMARKS

In response to the office action mailed October 13, 2006 ("Office Action"), Applicants have amended claims 15, 51, and 69 to more particularly point out and distinctly claim the subject matter which they regard as their invention. No new matter has been introduced by these amendments. Claims 1, 2, 6, 7, 9-11, 13-24, 28, 30, 31, 51-58, 66-79, 81-83, and 86 are presented for examination.

Rejection under 35 U.S.C. § 112, 2nd paragraph

Claims 1, 15, 51, and 69 are rejected as being indefinite. See the Office Action, page 2, lines 12-14. Specifically, the Examiner asserts that "[c]laims 1, 15, 51, and 69 are vague and indefinite because it is unclear as to what types of defects are intended, i.e., pinholes, cracks, metal or oxide contaminants, lattice displacements, etc." See the Office Action, page 2, lines 15-16.

According to the specification, a "defect" refers to "a crack or a blister, such as a crack or a blister that is detectable by visual (or optical) inspection." See page 4, second paragraph. In view of the specification, one skilled in the art would clearly understand what a "defect" means. Thus, Applicants submit that the claims 1, 15, 51, and 69 are not indefinite and request that this rejection be withdrawn.

Rejection under 35 U.S.C. § 103(a)

The Examiner rejects claims 1, 2, 6, 7, 9-11, 13-24, 28, 30, 31, 51-58, 66-79, 81-83, and 86 as being obvious on three grounds. See the Office Action, pages 2-8. Applicants traverse each ground below:

I

Claims 1, 2, 6, 9-11, 13-23, 28, 30, 31, 51-54, 56, 82, 83, and 86 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Mizuta et al., EP 0 277 020 ("Mizuta") in view of Smith et al., U.S. Patent No. 6,172,009 ("Smith"). See the Office Action, page 2, lines 20-22.

Independent claims 1, 15, 51, and 69 are discussed first. They cover methods that include disposing a precursor solution onto a surface to form an intermediate or a superconductor material. The precursor solution contains a carboxylate salt of a rare earth metal (e.g., yttrium), a

fluorinated carboxylate salt of an alkaline earth metal (e.g., barium), and a non-halogenated carboxylate salt of a transition metal (e.g., copper). According to the specification, among other advantages, such a precursor solution can result in an intermediate or a superconductor material having a low defect density, e.g., defects contained within the intermediate or the superconductor material include less than about 20 percent of any volume element defined by a projection of one square centimeter of a surface of the intermediate or the superconductor material. See, e.g., page 3, lines 4-10 and page 16, lines 5-9.

The Examiner acknowledges that Mizuta does not teach that "the barium or yttrium precursors may be fluoroacetate," but relies on Smith for disclosing a fluorinated carboxylate salt of an alkaline earth metal (e.g., barium), as required by claims 1, 15, 51, and 69. According to the Examiner, "it would have been obvious ... to have used barium fluoroacetate and yttrium fluoroacetate [disclosed in Smith] as the particular precursors for Ba and Y oxides [in Mizuta] ... with a reasonable expectation of success and with the expectation of similar results because [Smith] teaches that they are suitable precursors for the formation YBCO superconductors." Applicants disagree.

Mizuta describes a precursor solution containing metal compounds selected from salts, chelates, halides, hydroxides, peroxides, and oxides. See page 2, lines 17-18. It also states that "[a]ny metal compound of the above-defined kind may be used as long as it gives an oxide upon calcination" and lists a number of exemplary metal compounds. See page 2, line 33 and Examples 1-17. However, it does not disclose or suggest a precursor solution containing any halogenated metal compounds. Indeed, none of the metal compound precursors disclosed in Mizuta contains any halogen groups, let alone a fluoride group in a fluorinated carboxylate salt of an alkaline earth metal, as required by claims 1, 15, 51, and 69. Thus, in view of Mizuta, one skilled in the art would have not have been motivated to replace a non-halogenated carboxylate salt of an alkaline earth metal with a fluorinated carboxylate of an alkaline earth metal, as required by claims 1, 15, 51, and 69.

Smith also does not provide such motivation. It describes a precursor solution containing trifluoroacetate salts of yttrium, barium, and copper. Smith expressly teaches that all metal compounds in the precursor solution are in the form of their trifluoroacetate salts because non-halogenated metal carboxylate or metal alkoxide precursors are sensitive to secondary reactions

(e.g., formation of barium carbonate), which result in inferior superconducting properties. See, e.g., column 1, line 55 to column 2, line 8. To the extent that Smith teaches that using non-halogenated metal carboxylate precursors would result in inferior superconducting properties, it **teaches** one skilled in the art **away** from using such precursors. Thus, one skilled in the art reading Smith would not have been motivated to use non-halogenated metal compounds, such as those described in Mizuta. Further, Smith is interested in forming a film containing barium fluoride as an intermediate of the superconductor product. See, e.g., column 9, lines 4-7. Using non-halogenated salts described in Mizuta would reduce formation of metal fluorides, which is clearly contrary to the goals of Smith.

In sum, Mizuta describes a precursor solution containing **only** non-halogenated compounds and Smith describes a precursor solution containing **only** halogenated compounds. Neither Mizuta nor Smith discloses or suggests a precursor solution containing **both** (1) a fluorinated carboxylate salt of an alkaline earth metal (i.e., a halogenated compound) and (2) a non-halogenated carboxylate salt of a transition metal (i.e., a non-halogenated compound), as required by claims 1, 15, 51, and 69. There is no suggestion either in Mizuta or in Smith to combine a fluorinated carboxylate salt of an alkaline earth metal and a non-halogenated carboxylate salt of a transition metal to obtain a precursor solution required by claims 1, 15, 51, and 69. Indeed, as discussed above, such a combination would be contrary to the goals of Smith.

For the reasons set forth above, claims 1, 15, 51, and 69 are not obvious over Mizuta in view of Smith. Neither are claims 2, 6, 9-11, 13, 14, 16-23, 28, 30, 31, 52-54, 56, 82, 83 and 86, each of which depends from claim 1, 15, 51, or 69.

II and III

Claims 1, 2, 6, 7, 13-17, 20-24, 28, 30, 31, 51, 56, 58, and 86 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Smith in view of Chen et al., EP 0 431 813 ("Chen"). See the Office Action, page 4, lines 12-14. Claims 1, 2, 6, 7, 13-17, 20-24, 28, 30, 31, 51, 55-58, 66-79, 81, and 86 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Fritzemeier et al., U.S. Patent No. 6,022,832 ("Fritzemeier") in view of Chen. See the Office Action, page 6, lines 11-14. Since Applicants' arguments against these two rejections are similar, Applicants traverse these two rejections together.

As discussed above, independent claims 1, 15, 51, and 69 cover methods that include disposing a precursor solution onto a surface to form an intermediate or a superconductor material. The precursor solution contains a carboxylate salt of a rare earth metal (e.g., yttrium), a fluorinated carboxylate salt of an alkaline earth metal (e.g., barium), and a non-halogenated carboxylate salt of a transition metal (e.g., copper).

The Examiner acknowledges that Smith and Fritzemeier do not disclose using a copper salt other than a trifluoroacetate and relies on Chen for disclosing a non-halogenated copper carboxylate salt. According to the Examiner, "it would have been obvious ... to have used a copper salt such as copper ethylhexanoate[, as disclosed by Chen,] in addition to, or in replacement of, the copper trifluoroacetate of [Smith] with the expectation of similar results because [Chen] teaches that such combinations are suitable copper precursors for forming YBCO superconductors." See the Office Action, page 5, lines 13-17. Applicants again disagree.

As discussed above, Smith describes a precursor solution containing only halogenated compounds (i.e., trifluoroacetate salts of barium, yttrium, and copper). It teaches one skilled in the art away from using non-halogenated metal carboxylate precursors because they would result in inferior superconducting properties.

Fritzemeier discloses using a trifluoroacetate precursor solution as described in Cima et al., U.S. Patent No. 5,231,074 ("Cima"). As discussed in Applicants' response filed on August 15, 2006, Cima expressly teaches that all of the metal compounds in a precursor solution are in the form of their trifluoroacetate salts because superconductor films prepared from non-halogenated metal carboxylate precursors provide inferior properties, possibly due to trapped residual precursor materials. See, e.g., Cima col. 1, lines 33-47. In other words, similar to Smith, Cima and Fritzemeier also teach one skilled in the art away from using non-halogenated carboxylate precursors.

Further, both Smith and Fritzemeier (including Cima) are interested in forming a film containing barium fluoride as an intermediate of the superconductor product. Using a non-halogenated copper salt (e.g., copper ethylhexanoate) described in Chen would reduce formation of metal fluorides, which is clearly contrary to the goals of Smith and Fritzemeier. Thus, one skilled in the art reading Smith and Fritzemeier would not have been motivated to use copper ethylhexanoate as described by Chen.

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In addition, one skilled in the art reading Chen would also not have been motivated to use copper ethylhexanoate described therein in the precursor solution described in Smith and Fritzemeier. As mentioned in the August 15, 2006 response, Chen uses copper ethylhexanoate in a precursor solution because it wants to provide hydrolysis and polymerization of its rare earth metal alkoxides and alkaline earth metal alkoxides to form primarily chain-like metaloxane polymers. See, e.g., column 3, lines 5-12. Note that the only rare earth metal and alkaline earth metal precursors that Chen discloses are alkoxides. See column 7, lines 5-15. By contrast, the precursor solutions described in Smith and Fritzemeier do not contain alkoxides at all. As a result, there is simply no reason to use Chen's copper ethylhexanoate in the precursor solutions described in Smith and Fritzemeier.

For the reasons set forth above, claims 1, 15, 51, and 69 are not obvious over Smith or Fritzemeier in view of Chen. Neither are claims 2, 6, 7, 13, 14, 16, 17, 20-24, 28, 30, 31, 55-58, 66-79, 81, and 86, each of which depends from claim 1, 15, 51, or 69.

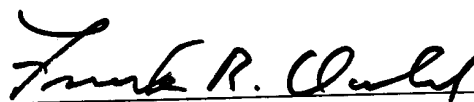
CONCLUSION

Applicants submit that the grounds for rejection asserted by the Examiner have been overcome, and that claims 1, 2, 6, 7, 9-11, 13-24, 28, 30, 31, 51-58, 66-79, 81-83, and 86, as pending, define subject matter that is definite and non-obvious. On this basis, it is submitted that all claims are now in condition for allowance, an action of which is requested.

Enclosed is a check for the Petition for Extension of Time fee. Please apply any other charges to deposit account 06-1050, referencing Attorney's Docket No.: 05770-156002.

Respectfully submitted,

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Frank R. Occhiuti
Reg. No. 35,306

Fish & Richardson P.C.
225 Franklin Street
Boston, MA 02110
Telephone: (617) 542-5070
Facsimile: (617) 542-8906
21556257.doc